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Volume XVI SATURDAY, NOVEMBER 18, 1922 Number 412

INFLUENCES AFFECTING THE ADVANCEMENT OF EDUCATION AND RESEARCH[1]

HISTORIANS have rarely taken account of the effects of invention and the development of science and of general knowledge on man's economic, social and political status. In many instances it could probably be shown that inventions and scientific discoveries have led to the obvious and commonly recorded changes in the civilization of a particular people. An important invention or discovery may afford a tremendous advantage to one man in his competition with another, or to one nation in its relations with other nations. However, man's interest in the impulses and actions of men and in the mysteries of life is greater than his interest in things, and consequently, the records of all of the influences which have directly or indirectly affected human relations and progress are obscure. The influence of invention and science on the rise of man and upon the progress of nations offers a great opportunity for historical research. A history of civilization could well be written, the basis for which might be a selection of those inventions most far-reaching in their effects on the development of modern society and their relations to the progress of education, with the resulting obligations of institutions of learning not only to carry on instruction but also research for the further advancement of science.

From the records afforded by modern archæological and historical research, we know that great civilizations have been developed in the past, and that they flourished for periods as long as those with which we are most familiar, only to disappear with scarcely a tangible record of the causes of their decay. Whether our own civilization will follow a similar course, no man can prophesy. It would seem, however, that the universality of knowledge and the developments of science will prevent the recurrence of the great catastrophes of the past.

Under the most favorable conditions, knowledge progresses by means of slow accretion. The dissemination of knowledge is, therefore, an essential element in its further development. The conveyance of thought by speech was inadequate in the spread of knowledge, and its development was, therefore, retarded until the invention of more enduring and accurate methods for recording thought. The employment of picture writing and of hieroglyphics were steps toward man's first great invention, the alphabet and writing. Thereafter, the spread of knowledge was rapidly accelerated, for the thoughts and experiences of one man could be permanently recorded for the use and benefit of those who followed him. It was not, however, until the production of man's second great invention, the printing press and the use of movable type, that knowledge was democratized and given the impetus which was necessary in the advancement of civilization to its present state.

Quoting from Wells' *Outline of History*:

[1] Address upon installation as president of Lehigh University, October 14, 1922.

With the invention of writing, which developed out of pictorial record, human tradition was able to become fuller and much more exact. Verbal tradition, which had hitherto changed from age to age, began to be fixed. Men separated by hundreds of miles could now communicate their thoughts. An increasing number of human beings began to share a common written knowledge and a common sense of a past and a future. Human thinking became a larger operation in which hundreds of minds in different places and in different ages could react upon one another; it became a process constantly more continuous and sustained.

For hundreds of generations the full power of writing was not revealed to the world, because for a long time the idea of multiplying writings by making prints of a first copy did not become effective. The only way of multiplying writings was by copying one copy at a time, and this made books costly and rare. Moreover, the tendency to keep things secret, to make a cult and mystery of them, and so to gain an advantage over the generality of men, has always been very strong in men's minds. It is only nowadays that the great masses of mankind are learning to read, and reaching out towards the treasures of knowledge and thought already stored in books.

Nevertheless, from the first writings onward a new sort of tradition, an enduring and immortal tradition, began in the minds of men. Life, through mankind, grew thereafter more and more distinctly conscious of itself and its world. It is a thin streak of intellectual growth we trace in history, at first in a world of tumultuous ignorance and forgetfulness; it is like a mere line of light coming through the chink of an opening door into a darkened room; but slowly it widens, it grows. At last came a time in the history of Europe when the door, at the push of the printer, began to open more rapidly. Knowledge flared up, and as it flared it ceased to be the privilege of a favored minority. For us now that door swings wider, and the light behind grows brighter. Misty it is still, glowing through clouds of dust and reek.

The door is not half open; the light is but a light new lit. Our world to-day is only in the beginning of knowledge.

Working at the Royal Museum or University of Alexandria, Hero discovered the power of steam and invented a form of steam engine or turbine 100 to 150 B. C. Nearly two thousand years passed, however, before the Scotch instrument maker, James Watt, working in the laboratories of the University of Glasgow, perfected the steam engine and developed the third greatest invention, if measured by its influence upon human progress. Without doubt, the development of the steam engine more than any other single achievement has been responsible for the marvelous changes in the industrial, scientific, economic and political life of the world during the past century. Before the steam engine was perfected, most of the work of the world was performed by muscular energy, and the conditions of human labor were intolerable. Labor has been emancipated, and man has attained the measure of leisure which is essential to the development of higher ideals of life. The spread of education and the cultivation of science and the arts were the inevitable results of the multiplication of man's power through the use of steam.

Before the steam engine was perfected, no factory system had been developed for the manufacture of those commodities required for man's comfort and pleasure. With a source of mechanical power available in any quantity, it was inevitable that the inventive genius of man should be stimulated and that mechanical processes would rapidly supplement or replace human labor. Thus, during the last century industry has progressed with ever-increasing momentum, changing the whole economic and social life of the people and producing new demands for scientific knowledge and research, so that there has been a greater expansion of knowledge during this brief period than in all the previous history of civilization. While the influence of writing and reading and printing paved the way for the changes which have resulted from the utilization

of steam power, the effects of the latter have been more immediate and startling.

The invention of the machinery of modern transportation by land and water, the fourth in this list, has had a potent influence upon the extension of civilization and the economic status of man. Before the invention of the locomotive, the railway and the steamship, the world was large; now in comparison it is very small. The products of one community may be quickly transported to another, thus increasing men's desires and opportunities and producing an interdependence of interests between individuals and nations. Through these inventions man has truly "inherited the earth and the fulness thereof."

The fifth and last in this list of epoch-making inventions, each of which has produced so profound an effect on the progress of civilization, is the invention of electrical communication of intelligence,—the telegraph, the telephone, the wireless telegraph and the wireless telephone. By these electrical devices the thoughts of men can almost instantly be communicated to the most distant parts of the world. They have destroyed space and time and have made near neighbors of all men. It has been estimated that wireless communication between the two most remote points on the earth can be established in one-tenth to one-fifteenth of a second. The first message to be transmitted by telegraph, "What hath God wrought," is truly applicable to these marvels of modern science.

The list of revolutionary inventions and scientific discoveries which have been really beneficial to the development of a higher civilization could be indefinitely extended. From the earliest times the fate of nations has been determined by man's inventions. With the rapid advancement of scientific knowledge and its applications to the affairs of life, it would seem that the scientist and the engineer have it in their power to save the world or destroy it.

From the beginning, man has been a teacher. His experiences and knowledge were given to others by direct example or word of mouth before the invention of writing, and by personal instruction and the writing of books since that time. The bards devoted themselves to the preservation and dissemination of historical traditions and human experiences. Art and philosophy were developed by many peoples to an extent which excites the admiration and emulation of the modern world. A definite system of education, however, is the product of comparatively recent times. The philosophers had their pupils, the priesthood trained their neophytes in the mysteries of their religious cults, and there was doubtless a kind of education of the ruling classes. Occasionally some great genius appeared to propound new truths and to excite in the minds of men a desire for learning, but conditions were not favorable to the spread of knowledge beyond a limited group, and the education of the masses was discouraged rather than promoted.

The first educational institution in the world was the Museum or University of Alexandria, founded by Ptolemy I some 300 years before Christ. For a time this institution became the center of the intellectual life of the world. Its collection of books and manuscripts stimulated research and the advancement of science. Here during a brief period Euclid developed the science of mathematics. Archimedes perfected many great inventions, extended the knowledge of mathematical science and founded the science of engineering. Hero discovered the first principles of thermodynamics and Eratos-

themes laid the foundations for the science of astronomy. This period of scientific activity was short-lived, however, and the university became decadent through its fostering of the philosophies and cults of those who thus sought to solve the mysteries of life.

With the dying out of the torch of knowledge which for a time burned so brightly at Alexandria, the old apathy towards learning and science returned, and it was not until after the invention of the printing press that it again flared up and reached full brightness with the advent of the steam engine. The rise of the Roman Empire was characterized by an almost complete indifference towards the advancement of scientific knowledge. As one writer has characterized it, "Roman science was still-born into a suffocating atmosphere of vile wealth and military oppression. The true figure to represent the classical Roman attitude to science is not Lucretius, but the Roman soldier who hacked Archimedes to death at the storming of Syracuse." The same author further declares that the decline of the Roman Empire came about because "of the absence of any free mental activity and any organization for the increase, development and application of knowledge," despite the fact that "beautiful records of the beginnings of science were among the neglected treasures of rich men's libraries throughout the imperial domains," existing as "seed lying on stony ground."

During the long period from the beginning of scientific thought at Alexandria to the beginning of the modern scientific era, men observed the phenomena of nature, but they did not interpret them. Interest in the political upheavals which convulsed the world, and in the development of religious thought, absorbed the minds of the educated classes; while the common people were still chiefly concerned with the problems of an existence in which they were subjected to the whims of their political rulers. It is true that during this period educational processes were developed and extended; great literatures were created; the world was explored; art flourished; and a few men such as Galileo, Leonardo de Vinci, Newton and other early explorers in the field of science, laid the foundations for future work. The emancipation of the minds and bodies of men was begun, with the inevitable result that a thirst for knowledge, a desire to know the truth, and a longing for an explanation of nature's laws were developed. Yet at the time James Watt made discoveries which led to the perfection of the steam engine, he was constantly handicapped in his work through lack of any kind of scientific information to guide him in his experiments. Nothing was known of the properties of steam; in fact, it was but a short time before that the constitution of water itself had been determined. Because of the lack of scientific knowledge, many of man's most marvelous achievements have been the result of pure invention or accidental discovery. Each of these inventions and discoveries, however, has awakened and quickened our interest in pure science; and in consequence, there has been an ever-increasing accumulation of scientific information available for the use of those who are exploring and extending the boundaries of knowledge.

At first, men were content to discover the truth and they were little concerned with its applications. In this utilitarian age, however, we are no longer satisfied to accumulate knowledge for its own sake, but we are increasingly concerned with its adaptation to the use and benefit of mankind. Service to man, therefore, is the slogan of the scientist to-day. As Pro-

fessor Thomson aptly says, "For life is not for science, but science for life. And even more than science, to our way of thinking, is the individual development of the scientific way of looking at things. Science is our legacy; we must use it if it is to be our very own."

The discovery of America furnished a haven for those who were seeking political and religious freedom, and for adventurers inspired by the possibilities of personal gain and the lure of the unknown. It developed a freedom of action and thought which was largely untrammeled by the conventions of the old world. The necessities of a pioneer race stimulated human initiative and ingenuity and the desire for knowledge. Education was encouraged; in fact, it was early recognized that general education was essential to government by the people. It has become a fetish to Americans and we are all tremendously concerned with its successful administration and advancement. The opportunities of education in general, and of higher education in particular, are no longer reserved for special classes. They are available to any one who desires them. A certain amount of education is now required of every one; colleges and universities are subsidized by governmental and private agencies; and individuals attending them are partially subsidized. It is not inconceivable that the need for trained leaders in every branch of human activity may eventually lead the state to meet all of the expenses of individuals who are pursuing advanced courses which may be of peculiar value to the state.

Following the lead of the older universities of Europe, the colleges and universities of America at first limited their activities to the study of those subjects which had long been recognized as essentials to the training of men of culture, and to other subjects regarded as necessary to the preparation of men for the learned professions of theology, law and medicine. Science received but scant attention in the early curriculums, for its future importance was still but dimly recognized. A new note in American education was struck with the organization of the Rensselaer Polytechnic Institute in 1824, to furnish instruction "in the application of science to the common purposes of life," in order to train men to teach "the sons and daughters of farmers and mechanics * * * * and who will be highly useful to the community in the diffusion of a very useful kind of knowledge, with its applications to the business of living." Thus, the need for scientific and technical education was first recognized as essential to the "business of living" as it was characterized in the first announcement of the Institute. Further recognition of the growing importance of science and technology was given through the establishment in 1847 of the Lawrence Scientific School at Harvard, the Sheffield Scientific School at Yale, and of a course in civil engineering at the University of Michigan. It has been stated that these organizations "had a hard struggle for existence, because their aims seemed dangerous to academic traditions." The development of the Massachusetts Institute of Technology in 1865 and of Lehigh University in 1866 definitely established the importance of scientific and technical education. As was well stated by the first president of the Institute: "Material prosperity and intellectual advancement are felt to be inseparably associated" demanding "that systematic training in the applied sciences which can alone give to the individual classes a full mastery over the materials and processes with which they are concerned. Such a training, forming what might be called the intellectual element in production, has, we believe, become indis-

pensable to fit us for active competition with other nations in the race of industrial activity in which we are so deeply interested." President Rogers further stated that "such training should help to extend more widely the elevating influences of a generous scientific culture."

The work of these pioneer institutions was of tremendous importance in developing in the minds of the people an appreciation of the practical value of science in its relation to industry. A full measure of popular support was not accorded scientific and industrial education and research, however, until the organization of the land-grant colleges, which began in 1867 under the provision of the Morrill Land-Grant College Act of 1862. By this act the federal government gave to each state a public land scrip amounting to 30,000 acres for each senator and representative in Congress, providing "for the endowment, support and maintenance of at least one college, whose leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanical arts . . . in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

These colleges have now been organized in each of the states of the Union, either as independent colleges of agriculture and mechanic arts, or as state universities. Originally endowed by the federal government, they are now supported chiefly by funds provided by the state. These and other state institutions of higher education organized independently of the Land-Grant College Act have popularized higher education to an extent which a few years ago would have been thought impossible. They are truly "of the people, by the people and for the people." These institutions have rendered a vast service through the dissemination of knowledge and the development of scientific research. They have contributed largely to the increase of wealth through the applications of the results of research to the agricultural and manufacturing industries, and to the conservation of the natural resources of the state. These institutions have contributed so largely to the wellbeing of all of the people that they are regarded with the greatest pride and enthusiasm. Funds for their maintenance and support are given in an ever-increasing amount and their usefulness will be limited only by the limits set by legislative appropriations.

By an act of Congress approved March 2, 1887, provision was made for the establishment and maintenance at the land-grant colleges of agricultural experiment stations "to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigations and experiments respecting the principles and applications of agricultural science." By this act, definite recognition of the importance and value of scientific research was given and its stimulating effects have been felt in every branch of science. The economic value to the country of the work of these stations is incalculable. Through the scientific study of soils and climate, of the breeding of plants and live-stock, of fertilizers and crop production, and the economics of farm life, the wealth of the country has been vastly increased. Soil has been conserved; and the food supply assured. No less important has been the improvement in the status of the farmer and of life on the farm.

The remarkable success of these agricultural experiment stations has led to repeated attempts to secure federal support

for establishing and maintaining similar stations for scientific research of importance to engineers, and to the mining, manufacturing and transportation industries. For reasons which need not be discussed, each of these attempts has failed. The importance of engineering research in educational institutions was first formally recognized by the University of Illinois, through the organization of its Engineering Experiment Station, by an act of the Board of Trustees on December 8, 1903. This pioneer station has fully justified the faith of its founders in the need and value of technological research. It has contributed largely to our understanding of engineering processes and materials and it has stimulated a desire for the substitution of precise, scientific methods for empirical "rule of thumb" practices in the engineering industries. It has been of assistance in the development of the literature of engineering and technology, and in the training of men for scientific service in the industries; and it has been a model for a great number of similar stations which have been recently organized elsewhere. Like that of the agricultural experiment stations, much of the work of the engineering experiment stations has had a very direct monetary value resulting from the conservation of the natural resources, economies in design and construction of engineering structures and products, and the discovery of new processes of great commercial importance.

Institutions of higher education are the store-houses of accumulated knowledge, and it is not at all remarkable, therefore, that many of the great contributions to pure and applied science have been made by their professors and students. While teaching is the obvious and apparently chief function of a university, it should be its purpose to place scientific research in a position of equal importance with the work of instruction, for the world must largely depend upon it to extend the boundaries of knowledge and to show its applications to the affairs of life.

Since the development of technological science and of technical education has followed rather than preceded the development of the basic industries, it was necessary to build up these industries by empirical methods and procedures, based upon practical experience, which were changed or modified when the results sought were not secured. Naturally, such methods were expensive and wasteful. Few persons cared whether a new process or method of production was the most efficient that could be obtained, provided that it was more efficient than methods which had previously been employed.

Wasteful methods have characterized the development of American industries. Our vast natural resources have seemed inexhaustible and there has been small regard in the past for their economical utilization. Only during recent years have we come to understand that there is a limit to our resources in coal, oil, minerals and soil beyond which we can not go, and that they must be conserved by every method which modern science can devise.

Until recently, comparatively few of the engineering industries have appreciated the value of scientific research. Now most of them recognize its importance and many of them are concerned with its promotion. A few of the large industrial organizations have developed splendidly equipped laboratories devoted to the solution of problems of fundamental importance to their own interests and not infrequently to the advancement of pure science. During recent years a considerable number of trade associations have been organized to study and promote the interests of the firms having membership in these associations, and in many of them, important investigations

have been undertaken in laboratories which they have developed, or in cooperation with private or university laboratories. As a result of the war and the need to solve a great variety of new industrial problems quickly, the interest in research has been increased enormously and without doubt the importance of utilizing scientific methods will lead to the elimination of much of the waste which has been characteristic of the earlier industrial development.

Undoubtedly, the solution of many of the problems of the industries can best and most economically be undertaken through cooperation with the universities and technical schools, in so far at least as these problems involve the discovery of scientific information of basic importance. Educational institutions are interested in the establishment of facts, and work conducted by them is therefor less likely to be affected by prejudices. Furthermore, many of these institutions have facilities both in apparatus and men which can not readily be duplicated by any private laboratory. Thus, those engaged in engineering research in a modern university have advantages which accrue to them through association with professors of physics, chemistry, bacteriology and other branches of pure science which may have a direct bearing upon engineering investigations in progress. Coöperation between university departments, therefore, aside from the advantages of library and other facilities, accentuates the importance of the university as a center for research in applied science, to a greater extent than has normally been recognized. Unfortunately, many leaders of industry have under-estimated the work of men engaged in academic pursuits. This scorn for academic processes is rapidly changing, and in an ever-increasing degree, the industries of the country will look to the university and technical school for assistance and will coöperate with them to their own advantage as well as to the advantage and the advancement of education and progress.

In the important work of educating men for industrial leadership, Lehigh University was a pioneer, and for nearly sixty years the university has established fine traditions and has maintained the highest ideals. The institution has done much toward the development of the profession of engineering and the elevation and standardization of scientific and engineering education in America; and her contributions to literature and science have been noteworthy. With a large vision of the future demands upon the engineer, she has endeavored to train men of high professional ideals rather than mere technicians. Through the influence of the College of Arts and Science, classical as well as contemporary learning has been fostered, and technical and arts students alike have experienced the stimulating effects which come through the study of older civilizations and their influence upon modern life and culture.

Recently, engineering was defined as "the art of organizing and directing men and controlling the forces and materials of nature for the benfit of the human race." This definition recognizes the changing status of the work of the engineer and the constantly increasing need for men who are capable of working with other men as well as with materials and processes. Ultimately the technical curriculum will include the study of human relations as well as the study of things, and it will take cognizance of the fact that to organize men one must be proficient in the art of expression, and to handle men, one must understand them.

Lehigh University has great opportunities for the effective coördination of the work of the various colleges in the train-

ing of men for real leadership in industry and business. With these opportunities, however, there are large responsibilities. The problems of a modern university are complex and difficult of solution and its needs are large. A Mark Hopkins at one end of a log no longer constitutes a university capable of coping with the educational needs of the day. Such institutions must now be provided with adequate facilities in buildings, equipment and endowment, and with faculties of highly expert specialists, for they must encourage and promote scholarship by every possible means, if they fully discharge their obligations to society.

CHARLES RUSS RICHARDS
LEHIGH UNIVERSITY

WHY THE PUBLIC CRITICIZES US, ITS ELEMENTARY TEACHERS

That the prevalent dissatisfaction with the public school as a national institution is just we must, at the very outset, agree. One has only to step into almost any legislature, from the national down, to know that the education of many of the men there with regard to the keeping of a trust was neglected. A trip to a municipal park will make one wonder where the public learned, or failed to learn, its consideration for others and its respect for property rights, public or private. The custodians of any prison wonder what we taught so many of their charges who have definite proof that they exposed themselves for a time at least, to our influence.

In a polyglot nation, such as ours is, at least in the sources from which its citizens have come, the public school must take on all the duties which no one else can be held responsible for. Many parents of young children have come but recently from countries whose customs and laws are so different from ours that the standards to which they have been held are utterly unsuited to their children. It takes time for them to become conscious of this fact, and still more time for these standards to be replaced by suitable ones, even when the language is understood. It does not take nearly so long for a child to grow up, certainly not nearly so long for him to realize the bewilderment of his parents and, in all too many cases, to take advantage of that bewilderment and get utterly beyond control. Another large body of our children come from homes where the child, by virtue of the parents' achievements, takes a place in a higher stratum of society than did the parent. Too few people realize how well defined and varied are the standards in each of our many communities, as well as in the so-called "circles of society." I remember hearing a New England lady tell with evident enjoyment a story of the visit of a young cousin from a wilderness home. The head of the household was accustomed to ask each child, "What shall I serve you?" when carving. Upon asking the small visitor first she answered with comical self-possession, "Whatever you've a mind tuh." According to the standard of her home and community the gracious reply was the proper one, but according to the standard of the host, the fact that it was incorrectly stated made it absurd.

This condition, then, leaves comparatively a small portion of our homes able to supply the standard by which a child may judge his own conduct and that of his companions. To be without such a standard is quite as safe for the child as it would be for a new captain to set sail in a strange sea without chart or compass. Teachers who have come from homes where the standards supplied them were ever adequate cannot understand the apparent lack of judgment which this condition of affairs produces in children apparently bright enough to appreciate the value of a reputation for good behaviour. The teacher

who has been in a position where the good standard of her home was inadequate, who had to set about finding why it was inadequate and what would take its place without outraging her sense of the fitness of things, entirely without aid, knows how to supply to the child, who often covers his bewilderment with a cloak of nonchalance or of truculence, a new standard which will fit the situation. When done quietly and unobtrusively, his respect for his parents who, while probably willing, were utterly unable to help him, will not be impaired. The utter and unquestioning loyalty of both the child and his parents to such a teacher makes her a power in the communities where such families congregate. But the supply of such teachers is far smaller than the need, and there has yet been found no way in which the small supply we have can be reserved for the exclusive function of teaching standards of citizenship, for that is what it amounts to, and the need is just as great, though in a different way, in the purely American districts, as it is in the foreign. Meantime, this work goes undone in a great many classes, or is done with so little skill and understanding that the reputation for lack of sympathy with the children seems to have fastened itself to the teaching profession as a whole. I deny most emphatically the justice of this criticism. We are not unsympathetic as a body, nor are the majority of the teachers as individuals. The real trouble is that to do this work efficiently involves specialized training or an experience far beyond the reach of the mass of teachers, who are already thoroughly burdened with a crowded curriculum, to prepare for the intelligent presentation of which takes every bit of the small reserve which the salary of the American teacher at present permits her to accumulate.

I have had occasion to enter schools in the capacity of social worker and have found the teacher entirely willing to give me the assistance I needed and, in most cases to ask me if I could offer suggestions as to the more intelligent management of that or other puzzling pupils. Social workers in general complain of the unresponsiveness or irritability of teachers. I have been accused of "making the teacher think she knows it all" as a means of winning cooperation. I do not agree. I simply do not feel that a social worker who has seen the child possibly on four or five occasions has any right to presuppose a greater knowledge of his characteristics than the teacher who has had him five hours a day for a greater or less part of a year, knows the parent generally, the companions he chooses, and his ability or inability to report truthfully the aggravations he suffers at her hands. Further, it is not my custom at any time to use my authority to criticise, antagonize, or coerce, those with whom I must deal, until I am sure that I am in possession of all the facts in the case. There is no use in expecting even the best of dogs not to bite if you strike him on the sore head, and that is exactly the position of the harassed and overworked teacher under the present conditions.

This criticism does not come from social workers alone. It comes from doctors and nurses who do not know as we do that the case of the patient he finds us unsympathetic with has often been aggravated for some time by the neglect or overindulgence of the parent, and that often the efforts of the school to have the matter righted have met with indifference or even antagonism. Notwithstanding the fact they know this condition to exist, the school authorities feel responsible for holding the standard of the school as high as that of

other schools where the same degree or kind of difficulty is not to be met with. The parent often holds the school responsible for the failure of the child to progress, regardless of what he does or does not do to make it possible for the child to assimilate what is given him. For the benefit of doubters I can cite several cases within my own experience where the parent refused to permit the children's eyes to be examined or to have it done themselves, and one mother removed two exceedingly anemic children from the school, after having given permission for the children to be examined, when the doctor's recommendation was tonsilectomy. Almost any public school teacher can cite similar cases.

But, in spite of handicaps, physical, mental, and social, the criticism has continued until the school people of the country are in the position of a good housewife who, hearing her house criticised, feels it is due to her housekeeping, and enters upon such an orgy of housecleaning that when she realizes the fact that it has become a vicious habit she finds that her husband has taken to making the saloon his home and most of her children the streets, while her house, poorly furnished to begin with, is now practically threadbare. Most undoubtedly American children, with the exception of those whose parents are possessed of abundance of resource, financial or mental, are getting their education from the streets and the picture shows, rather than from the definitely appointed teacher.

The remedy, as I see it, is, first and foremost, a more understanding attitude on the portion of the public capable of appreciating the difficulties these conditions present here in America. The "individual attention" now so widely called for is not the solution and is working harm at present. Some of the great normal schools of the country are stressing it to the detriment of the efficient organization of the school. Where so many children must be cared for by one teacher, and it is hopeless to expect the number to be reduced until the facilities for housing and supplies, to say nothing of medical attention and food, are brought to something like adequacy, organization is the first consideration. If her work is not thoroughly organized the aggressive but not too industrious child will demand and get more help than is good for him, while the less forward or more considerate child waits, often in bitterness, for the turn that may or may not come. We have so many of these aggressive but not too industrious people in our industrial life today that no one should have any difficulty in believing they are in the school.

I was this summer in a class in a great normal school where "individual attention" was stressed. The teacher was kept so busy with those who preferred to ask her rather than to make the effort to remember directions or to think for themselves that she was unable to learn to know her pupils; consequently she missed entirely those slow but worthy ones who deserved help, and could not keep her brighter ones supplied with enough work to satisfy them. The result was that I heard one frail student from an ill-paid section of the South mourn "Just sixteen dollars wasted," while a bright student vented her exasperation in the amusing remark, "If ever I get my coattails out of here!"

The worth of individual attention to a child depends upon his ability and his real need, not upon his aggressiveness and persistence or that of his parent, nor upon his willingness to accept all the help he can get. The teacher should have her work so organized that she has time and energy to judge this fairly in justice to the child, his associates and herself. To give him

more help than he needs is to make him less dependent on his own resources, and more dependent on others. If any one doubts that this resourcefulness has been weakened let him visit the cheap picture show district night after night. It will not take him long to wonder what the people would do if they had to amuse themselves. This cannot be said of other nations to anything like the extent it must be said of us, though undoubtedly the unrest the war brought in its wake is to blame for some of this everywhere.

When this change of attitude on the part of the public becomes apparent and more support, financial and moral, is given the schools, a better division of labor can be made by the school authorities. As it is at present practically every field is carrying burdens not properly belonging to it. There is no question that the old classical education cannot be used for all when compulsory education laws bring in children who are totally unfitted for any but the most practical work. To deprive those who need the classical education because of the presence of those less competent is quite as sensible as it would be to close the Metropolitan Museum because many people find nude statuary immoral! There is, in my opinion, nothing better for the training of the precious analytical mind, of which we have so few, than part of the old type of education. This condition makes necessary several types of schools if we are to do justice to all. These various types of schools must be attended by carefully selected groups of pupils from all walks of life. The uneducated man is justified in his demand that his bright son be permitted to go as far as his ability will carry him and we face the bitter opposition of organized labor if these selections be made on any basis but that of real ability, or by any but recognized experts. Intelligence is not always a respector of class or family, all beliefs to the contrary notwithstanding. I have had in the second and third grades of a country school three children of one family, aged 13, 11, and 8, while their 12 year old brother was in third year high school, and that family, low grade and well nigh destitute, provided a horse for him to ride as he was not strong enough to walk.

This division of labor will release some of the strain upon the elementary teacher who can then turn her attention to improving her own education. As matters now stand all the courses she can afford to take must be in the field she teaches. This is disastrous. She must keep step mentally all year with the young child and then she must spend her vacation in classes in method, the standard of which is the span of that same child mind, or worse still, she goes into a class where she must read great quantities of theoretical or technical material, much of which is more or less abstract. This does not afford her the relaxation which the cramping of her mind all year demands if she is to avoid becoming "set in her ways," nor does it afford her the well stocked mind so necessary to appreciate much outside material which is so valuable to her as well as to her classes.

That methods are necessary, I grant you, but they should be obtained just as a mother obtains new recipes for the food supplied the children. No mother, having once had a good course in food values and cooking, goes back to cooking school again and again. I know teachers who go to summer school practically every summer, almost always taking work in their own field. If the public is right in its criticism that we are not well educated, and I am not sure it is wrong, mere polishing of our tools is not going to remove the cause of the trouble. We can remedy this by leaving the normal school for the beginning

teacher, the teacher who is unsupervised, and our supervisors who must then provide us with opportunity during the winter to learn what she has obtained. That will leave us free to go to a good university, not with the idea of recreation alone, for that would not be fair to the university, but with the idea of taking work in fields which hold real interest and profit for us as citizens, not as teachers, meeting people in other branches and in other professions, finding rest and relaxation in a new atmosphere. No teacher who has learned thoroughly the principles of learning and of teaching, of sociology and psychology need spend six weeks learning methods in these days when normal training is so generally required for entrance to the profession, and supervisors provided to see that we get not too far astray. That those supervisors must be cooperated with is necessary but they will find teachers more tractable after a summer away from their work than when they return from normal school.

The most just objection to us here in America comes from the highly educated class. The teacher may be the finest first grade teacher in the city but if her personal standards of citizenship are plainly lower than they want the child to adopt they will be reluctant to put the child in her charge. These people have an ideal of a teacher which they wish the child to share. I do not know that they are wrong, even though often they who are able help us but little toward a solution of our problems; but I do know that, generally speaking, they appreciate the effort made to remedy this condition when we recognize it.

The future of America is precarious, it seems to me, unless we can succeed in checking the "slide to mediocrity" and in raising the standard of citizenship. The first step in this direction is to be gained only when each and every member of the professional class rises to a determined effort to regain the old prestige which is lower now than ever before and lower here than is generally the case in other countries. Teachers are not the only ones who suffer from this unfair treatment. But teachers, elementary teachers especially, are less able to escape from it and, at the same time, in the best position to make a determined stand against it. A fair and impartial examination and analysis of the situation as I have endeavored to present it, will, I hope, show some of us some method we can adopt to do our part.

BESSIE KELLY

BROOKLYN, NEW YORK

EDUCATIONAL EVENTS

THE REPORT OF THE AFRICAN EDUCATION COMMISSION

MODERN American methods of education, especially as carried out in progressive rural communities, should be applied in educating the hundred million or more natives in Africa, according to the African Education Commission, which has just published its report. The chairman of the Commission was an American —Dr. Thomas Jesse Jones, for many years on the staff of the United States Bureau of Education and the Phelps-Stokes Fund—and author of the government's comprehensive survey of colored schools published in 1917. The other members of the Commission were British and African educators.

Successful efforts of some American rural communities to make their schools fit modern needs particularly impressed the Commission. "The methods of rural education organized by Hampton and Tuskegee, and extended by such agencies as the General Education Board, the Jeanes and Slater Funds, and the United States Department of Agriculture," says the report, "are the most significant of all for those who have the responsibility for the education of Colonial Africa. Students of the community extension of education will do well to study the methods of the United States Department

of Agriculture, the great agricultural colleges of the United States and Canada, and the rural movements in behalf of American Negroes." Dr. Jones and the other members of the Commission believe that the future of Africa depends upon a program of education based on social and economic needs and adapted to native conditions. They point to the folly of merely applying without change traditional English and American school and college methods, as has been attempted in many places. Academic types of education are necessary, including higher education, the report asserts, and natives must have an opportunity to prepare for leadership of their own people, but the great need of all Africa is general elementary education that will help the natives to keep healthy, to be free from fetish-worship and other forms of degradation, to have wholesome recreation, and to receive adequate training for agriculture and other industrial pursuits. Dr. Jones portrays Africa, not as the "Great Dark Continent," but as "the Continent of Great Misunderstandings"; a continent rich in material and human resources, awaiting only the magic touch of education—an education that must be adapted to the needs of the African people.

Special praise is given in the report for such American educational devices as the "movable schools" of Tuskegee Institute, Alabama, the farm demonstration work of the Federal government, home demonstration, the boys' and girls' clubs in farming communities and the Jeanes Fund plan of supervising teachers in use in the Southern States. It is by methods like these, Dr. Jones and the other members of the African Commission contend in their report, that Africa must be guided if the continent is to achieve its just place in civilization.

The report gives considerable prominence to the Republic of Liberia, in which the United States has been interested ever since the days of African colonization, early in the nineteenth century. The Commission declares that Liberia's fate depends almost wholly upon wise administration of the American loan to that country and the system of public education that will be possible under it.

THE NEW MINISTER FOR EDUCATION IN ENGLAND

THE Honorable E. F. L. Wood has been appointed president of the Board of Education in England in succession to Mr. H. A. L. Fisher, whose retirement was involved by the change of Ministry when Mr. Lloyd George resigned. Mr. Wood is 41 years of age and is the only surviving son and heir of Viscount Halifax. He was educated at Eton and Christ Church and All Souls, Oxford. He has represented the Ripon Division as a Unionist since 1910, and was appointed Parliamentary Under-Secretary for the Colonies last year.

A review of the work of Mr. Fisher as president of the Board of Education was recently given by the London *Times* in its *Educational Supplement*, together with an editorial retrospect and forecast which read, in part, as follows:

> Mr. Fisher's tenure of office was long and fruitful. It would be ungrateful, indeed, to say farewell to the late President of the Board without expressing on behalf of all educationists the sense of gratitude created by all that he has done for national education, for teachers and administrators. His efforts secured a statute which, if fully worked, is able to place England at the head of all nations in the matter of education. It is not his fault that this Act, in some very important particulars, is in suspense, though his friends would have liked to see him fight more strenuously for the preservation of the compulsory day continuation schools contemplated by the Act of 1918. But the Act, as a whole, is in force, and it has transformed the educational position. Under it it is possible to create universal secondary education and to link up all grades of education into an organic whole. . . . Mr. Fisher may fairly retire from office with a sense that he has done his duty. His successor will find the foundations well and truly laid.
>
> There are two obvious lines of progress for Mr. Wood to explore. The first is such adjustments of the present system within the limits laid down by the Act of 1918 as will give some certainty that the children of real ability are secured for public service. There is no certainty at present, and no one will deny that the children of the rural districts, a most hopeful source of supply for new ability, are gravely neglected. The organization of secondary education in the rural areas is a problem that the local authorities are

attacking too slowly. It can not be seriously grasped until junior secondary education is offered to every child in every village in England. Secondly the comparative position of this country needs consideration. How do we stand with respect to Belgium, France, Germany, the United States? Our columns from time to time point out the rapid progress that is being made in Germany, America, and other countries, but we doubt whether the Board of Education is keeping comparative standards in mind. It is necessary to have reports up-to-date of all European and American movements and educational achievements. This country must not fall behind if the next generation is to compete successfully in the markets of the world and in the realms of science and scholarship.

MEMORIAL SERVICE FOR PROFESSOR PATTEN

TRIBUTE to the life work of the late Dr. Simon N. Patten, for nearly 30 years professor of political economy in the Wharton School of the University of Pennsylvania, was paid at a special meeting of the American Academy of Political and Social Science, held recently in Philadelphia. Professor Patten died last July, after an illness of several months.

Among those who spoke were Dr. Leo S. Rowe, president of the Academy and director of the Pan-American Union, Dr. Lightner Witmer, professor of psychology, Dr. J. S. Lichtenberger, professor of sociology, and Dr. Edward P. Cheyney, professor of history, of the University of Pennsylvania.

Dr. Rowe said in part:

There are three outstanding qualities of his mind, all of which contributed toward making him a great teacher. The first was his openness of mind to every point of view, combined with a willingness to give careful and serious consideration to every opinion, no matter how widely divergent from his own. To every question to which he addressed himself, no matter how far removed from his special field of research, he brought an originality of viewpoint which illumined with new light and opened the door to new and unexpected solutions. At all times he showed an unwillingness to accept traditional opinion, unless tested by independent, searching analysis.

It was these three qualities that enabled him to develop in his students, not only profound intellectual curiosity, but, also the determination to subject traditional viewpoints to independent tests.

It is no mere coincidence that three of the great scientific organizations of the country are to-day presided over by his students: Dr. Samuel McCune Lindsay, president of the Academy of Political Science in the City of New York; Dr. Henry R. Seager, president of the American Economic Association, and Dr. James P. Lichtenberger, president of the American Sociological Society.

The educational history of this country offers but few instances of a teacher so deeply interested in the progress and welfare of his students. No sacrifice was too great for him when the advancement of one of his students was in question. He was prepared at all times to subordinate his personal affairs and convenience to the welfare of his students.

It was announced that the board of directors of the American Academy of Political and Social Science has established a research fellowship to be known as the Simon N. Patten Fellowship for Research, to be awarded under such conditions as the board may determine.

PASSAGE OF THE OREGON COMPULSORY SCHOOL ATTENDANCE BILL

THE Compulsory School Attendance Bill was passed at the Oregon state election on November 7 by a vote which was reported on November 9 as being: Yes, 106,996; no, 93,349. The purport of the bill, as given on the official ballot, is:

Requiring any parent or guardian or other person having control, charge or custody of a child over eight and under sixteen years of age, from and after September 1, 1926, to send such child to a public school during the entire school year, excepting (*a*) children physically unable; (*b*) children who have completed the eighth grade; (*c*) children between the ages of eight and ten living more than three miles from a public school, except where transportation is furnished; (*d*) children taught by parent or private teacher.

This measure, which was interpreted as having for its purpose the abolishment of private and parochial schools, was vigorously discussed during the campaign. More than 200 Oregon lawyers are said to have joined in a written opinion that the bill is unconstitu-

tional, and it is understood that the question will be carried to the Supreme Court of the United States.

THE COUNTRY LIFE CONFERENCE AT COLUMBIA

THE American Country Life Association met at Teachers College, Columbia University, New York City, November 10 to 12. Sociologists, educators, and religious and civic workers were in attendance from all parts of the United States. The rural community was the main theme of the meeting.

Following the opening address by Dean James E. Russell of Teachers College, student speakers from India, China, Siam, Czechoslovakia, South America, Armenia and Russia told of the rural conditions in their countries. Dr. Kenyon L. Butterfield, president of the association, was one of the speakers on the three-day program, as were also Professor O. G. Brim, of Cornell University; Lee L. Driver, of the State Department of Education of Pennsylvania; C. W. Pugsley, assistant secretary of agriculture; C. B. Smith, of the States Relation Service; W. L. Gillin, of the University of Wisconsin; E. L. Morgan, of the University of Missouri; R. E. Heironymous, of the University of Illinois; Dr. C. J. Galpin, of the United States Department of Agriculture; Paul L. Vogt, of the Methodist Board of Home Missions.

EDUCATIONAL NOTES AND NEWS

CONGRESSMAN SIMEON D. FESS, who was elected to the United States Senate from Ohio last week over Senator Atlee Pomerene, was in college work for many years before going into politics. He was professor of American history at Ohio Northern University from 1889 to 1896, head of the college of law from 1896 to 1900, vice-president of the university from 1900 to 1902, graduate student and lecturer at the University of Chicago from 1902 to 1907, and president of Antioch College from 1907 to 1917. While in the lower house of Congress he has served as chairman of the Committee on Education, and his name has been attached to important educational measures, including the Fess-Capper bill for physical education and the home economics amendment to the Federal Vocational Education Act.

MISS AGNES S. WINN, director of the Division of Elementary School Service of the National Education Association, has prepared a booklet on the history and activities of the association that is being distributed.

PROFESSOR EMILIE LEGOUIS, of the University of Paris, is giving the Trumbull Lectures on Poetry at Johns Hopkins University this semester.

PRESIDENT LITTLE and the board of trustees of the University of Maine have been in conference with Governor Baxter in regard to the board's budget by which the university seeks a state appropriation of $1,375,000 to cover the next two-year period, and $217,500 to take care of an old deficit.

DR. SAMUEL DICKIE, president emeritus of Albion College, has resigned as chairman and treasurer of the endowment fund committee of Albion College, a position which he held for twenty-five years.

DISCUSSING the result of the election in Pennsylvania and the possible effect upon the Finegan education program in that state, the Philadelphia *Public Ledger* says:

> During the campaign the studious effort persistently was made to sow discord between the Republican candidate for governor and the present superintendent of public instruction and to persuade the public that Mr. Pinchot was in sympathy with if not an actual party to the endeavor to tear down the great work for the public schools which has been done during the last four years and to return to the reactionary and backward conditions which preceded it.
>
> Yesterday there came from the same mendacious source of misinformation the intimation that Dr. Finegan regarded the result of the election as a repudiation of his policy and that he contemplated immediate resignation and the abandonment of the work. This falsehood is squelched promptly by this frank statement from Dr. Finegan himself:
>
> "I am satisfied entirely with the cooperation we are receiving in all parts of the state and with the progress which the education program is making. I am gratified with the results of the recent election and the bearing which it may

be interpreted to have upon the work of this department. I am not seeking or considering another position."

This assurance, quite in line with the verdict of the people at the polls last Tuesday, strengthens the confident expectation that there will be no check in the forward progress in education which has marked the record of Pennsylvania since 1918. The people of this state would view as little less than a calamity any relaxation of the wise laws under which that progress has been attained; and they have shown by their reaction to the bitter and persistent attacks directed by McSparran against Dr. Finegan their conviction that the supervision of the schools is in safe hands.

SPECIAL CORRESPONDENCE

THE HOMEWOOD DEMONSTRATION SCHOOL AT JOHNS HOPKINS UNIVERSITY

1. *Purposes of the School*

THE Homewood Demonstration School was conducted from June 28 to August 19, 1921 in the Civil Engineering and the Mechanical Engineering buildings of the Johns Hopkins University under the joint auspices of the Board of School Commissioners of Baltimore City and the Johns Hopkins University.

The purposes of the school were:

1. To give children a chance to go to school during vacation.

2. To afford opportunities for the observation of teaching to the students of education in the summer session of the university.

3. To try an educational experiment.

4. To correlate closely mental and educational tests and measurements with school administration and pupil progress.

It was only one of the summer schools conducted by the Board of School Commissioners, but it was the only one where enrollment was restricted and conditional. All principals of elementary and junior high schools were invited to send any children who had made normal or above normal scholastic progress.

2. *Sources of Pupils*

Total enrollment from all sources in all grades..375
Total net roll from all sources in all grades....237

	BOYS	GIRLS
A. From no school to K-1st	6	11
B. From elementary schools to 2-6th	49	53
C. From elementary schools to 7-9th	34	36
D. From preparatory centers to 7-9th	13	6
E. From junior high schools to 7-9th	14	7
F. From private schools to 2-6th	3	3
G. From private schools to 7-9th	2	0

Elementary schools represented..... 42
Preparatory schools represented..... 3
Junior high schools represented..... 5
Private schools represented..... 4

3. *Organization of School*

As names of pupils were submitted to the superintendent before the opening of the school, they were tabulated by grades. The requirement of normal or above scholastic *attainment* excluded all *repeaters*. Every child must take up *new* work. This required vigilance in the placing of every child and offered some nice problems in organization. It was soon evident that some children were enrolling for the first half of the grade work while others wanted the second half; yet there was to be only one class of each elementary grade. The fourth, fifth and sixth grades all offered this problem.

Nothing could be done, however, until the opening of the school at Homewood. Then it was seen that the total number enrolled in the fourth and fifth grades was not so great as to be an obstacle, so it was decided by teacher and principal that the fourth grade should do 4A work, and the fifth grade 5A work. This meant "skipping" 4B or 5B for some children enrolled for these classes, yet it was the only way apparent to keep all children doing *new* work.

In the sixth grade the enrollment was so great that some other solution was necessary. The majority of the class had had no sixth grade work, and 6B is very important and can not well be "skipped." It, therefore, became a problem what to do with those who came for 6A work. On the basis of the scores obtained in the intelligence and accomplishment tests, and the judgment of the teacher, those who were deemed strong enough to do so, without injury to themselves, were allowed to enter 7B at once.

Those having low scores were excluded or eliminated from the school because there was no 6A class for them, and the probability of failure in 7B was too great to make it a profitable use of these children's time and energy.

Only two boys and three girls were eliminated in the sixth grade. This matter gave an opportunity for some team work of teacher, principal and educational psychologist and a close correlation of scientific tests and the personal equation.

Apparent health, physical development and physical age were contributing factors. The extremes of under-age or over-age were eliminated, except where conditions were unusual.

One girl, very much over-age for grade, was told she would not be able to do the work. She refused to take her dismissal; she begged and pleaded with all together and each in turn to be allowed to try the 7B work. At last it was learned that she was born in Italy, came to this country at eleven years of age and had reached the sixth grade in four years. She got her chance, and she made good.

Another case, a boy, made rather good scores in the tests but gave a poor impression when observed doing class work. He had a dazed look when a task was presented, and took a long time before beginning to write or to answer. The queston of defective sight or hearing was raised, but the class teacher did not think either was below normal, and said that his regular work in class graded well. He was sent to 7B. He failed to do the work at Homewood, and failed again in his regular school in February.

The 7A and 8A were too large to handle, so here again eliminations were based on the results of mental tests and teachers' judgments of the first week's work and attitude. Six boys and two girls were dismissed from 7A. Six boys and one girl were dismissed from 8A. Thus, it was only in the 6A, 7A, and 8A that any children were excluded. In all other classes in the school all those who enrolled were allowed to remain, no matter what their scores in the tests.

The problem in the kindergarten and primary grades was to get enough children enrolled to form classes for demonstration purposes. These children could be drawn only from a restricted field because of distance from their homes and their age and dependence. The excessive heat also kept some away and caused many to drop out.

4. *Course of Study*

The primary grades were to offer valuable school experience to the children enrolled, but were not intended to be included in the educational experiment tried in the grades from fourth through ninth.

The course of study in all grades was to be the new course just formulated by committees of teachers of the various grades and which was to be the official course of study in the schools for the year beginning September, 1921. This was in some respects a little easier in the lower grades than the old one, but rather more difficult in the upper classes because of the introduction of algebra in 7A.

Since children came to the 7-8-9 grades from elementary schools, preparatory schools and junior high schools, each of which had a different course, it became necessary to make special schedules to fit the former accomplishment of each student and the best adjustment of the pupil in the fall term. Children from the elementary schools took either French or Latin in the eighth grade.

Preparatory school children, in consequence of the concentrated course of study in preparatory schools, were usually placed a half year in advance of the other children. Thus June 7A children found 8A class at Homewood best suited to them, and June 8B preparatory children took 9B work at Homewood.

One girl, admitted without a card from her principal, took a special schedule of only three subjects in 9B. While she did well in these it was not sufficient to place her in the 9A class in September, and she was obliged to repeat the 9B subjects. She should have been compelled to take at least four subjects at Homewood.

Program of Studies in Junior High Class

The academic course was the only one offered.

1. English, in all classes—7B, 7A, 8B, 8A, 9B.
2. Mathematics in all classes.
3. History in all classes.
4. Geography in 7B and 7A.
5. General science in 8B and 8A.
6. Hygiene in 7B.
7. Latin in 8A and 9B.
8. French in 7A, 8B, 8A and 9B.

5. *Daily Schedule*

A. Length of session:

Kindergarten and primary from 8:30 A. M. to 11:30 A. M.

Intermediate and junior high classes, 8:30 A. M. to 12:30.

B. Recess:

Kindergarten and primary, 10 to 10:10.

Intermediate, 10:10 to 10:20.

Junior High, 10:45 to 11:00.

Recess time was different for each section of the school:

I. To avoid possible annoyance to regular university classes.

II. To give each group of children the freedom of the whole grounds to pursue the kind of activities best suited to the group.

There was a lunch room in the grounds. Milk was served to children as at the regular schools.

C. Schedules:

In the elementary grades each teacher made her own schedule, being entirely free as to time and place of each subject in her day's plan. In the junior high grades the day was divided into five periods of about 40 minutes each.

6. *A Demonstration School*

The Homewood Demonstration School was a laboratory in which the students enrolled in the various educational courses at the university could observe methods of teaching and pupil reactions.

Students enrolled in Education 21-A or Education 21-B were obliged by the conditions of each course to observe twenty-four hours of teaching during the term and to file a report of each lesson observed. For these students the school was open to observation each day from 8:30 to 12:30. Since there were 292 people enrolled in these two courses, this meant a minimum of 7,000 visits of an hour each.

In addition to this, any university instructor could arrange to bring his or her whole class for a demonstration lesson. These demonstration lessons were almost always given by the class teacher after one or more consultations

SCHEDULE FOR TEACHERS IN JUNIOR HIGH SCHOOL

	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	
Miss Heavey, C117						
1	8A Latin	8B French	9B French	7A French	9B Latin	8:40
2	9B Latin	8A Latin	7A French	9B French	8A French	9:20
3	8A French	9B Latin	8A Latin	8B French	9B French	10:00
4	7A French	7A French	9B Latin	8A Latin	8B French	11:00
5	8B French	9B French	8A French	9B Latin	8A Latin	11:45
Miss Stegman, C215						
1	8B Mathematics	7A Mathematics	7A Mathematics	9B Mathematics	8A Mathematics	8:40
2	8A Mathematics	8B Mathematics	7B Mathematics	7B Mathematics	9B Mathematics	9:20
3	9B Mathematics	8A Mathematics	8B Mathematics	7A Mathematics	7A Mathematics	10:00
4	7B Mathematics	9B Mathematics	8A Mathematics	8B Mathematics	7B Mathematics	11:00
5	7A Mathematics	7B Mathematics	9B Mathematics	8A Mathematics	8B Mathematics	11:45
Miss Grote, C214						
1	7B English	9B English	8A English	8B English	7A English	8:40
2	7A English	7B English	9B English	8A English	8B English	9:20
3	8B English	7A English	7B English	9B English	8A English	10:00
4	8A English	8B English	7A English	7B English	9B English	11:00
5	9B English	8A English	8B English	7A English	7B English	11:45
Miss Klinesmith, C115						
1	9B Civics	8A History	7B History	7B History	8B History	8:40
2	7B History	9B Civics	8A History	7A History	7A History	9:20
3	7A History	8B History	9B Civics	8A History	7B History	10:00
4	8B History	7B History	8B History	9B Civics	7A Study French	11:00
5	8A History	7A History	7A History	8B History	9B Civics	11:45
Miss Seymour, C114						
1	7A Geography	7B Geography	8B Science	8A Science	7B Geography	8:40
2	8B Science	7A Geography	8B Study French	8B Science	7B Library	9:20
3	7B Geography	7B Library	7A Geography	7B Library	8B Science	10:00
4	9B Study French	8A Science	7B Geography	7A Geography	8A Science	11:00
5	7B Library	8B Science	7B Library	7B Geography	7A Geography	11:45

SCHEDULE FOR JUNIOR HIGH SCHOOL CLASSES

9B	8A	8B	7A	7B	
Monday					
1 History	Latin	Mathematics	Geography	English	8:40
2 Latin	Mathematics	Science	English	History	9:20
3 Mathematics	French	English	History	Geography	10:00
4 Study French*	English	History	French	Mathematics	11:00
5 English	History	French	Mathematics	Hygiene	11:45
Tuesday					
1 English	History	French	Mathematics	Geography	8:40
2 History	Latin	Mathematics	Geography	English	9:20
3 Latin	Mathematics	History	English	Study	10:00
4 Mathematics	Science	English	French	History	11:00
5 French	English	Science	History	Mathematics	11:45
Wednesday					
1 French	English	Science	Mathematics	History	8:40
2 English	History	Study French*	French	Mathematics	9:20
3 History	Latin	Mathematics	Geography	English	10:00
4 Latin	Mathematics	History	English	Geography	11:00
5 Mathematics	French	English	History	Hygiene	11:45
Thursday					
1 Mathematics	Science	English	French	History	8:40
2 French	English	Science	History	Mathematics	9:20
3 English	History	French	Mathematics	Study	10:00
4 History	Latin	Mathematics	Geography	English	11:00
5 Latin	Mathematics	History	English	Geography	11:45
Friday					
1 Latin	Mathematics	History	English	Geography	8:40
2 Mathematics	French	English	History	Study	9:20
3 French	English	Science	Mathematics	History	10:00
4 English	Science	French	Study French**	Mathematics	11:00
5 History	Latin	Mathematics	Geography	English	11:45

*In science room. **In history room.

8:30- 8:40 Opening exercises.
8:40- 9:20 First period.
9:20-10:00 Second period.
10:00-10:45 Third period.
10:45-11:00 Recess.
11:00-11:45 Fourth period.
11:45-12:25 Fifth period.

English	Miss	Grote	C117
Mathematics	Miss	Stegman	C215
History	Miss	Klinesmith	C115
Geography	Miss	Seymour	C114
General Science	Miss	Seymour	C114
Hygiene	Miss	Seymour	C114
Latin	Miss	Heavey	C202
French	Miss	Heavey	C202

Notice daily change in schedule.

with the university instructor. In some very exceptional cases the university instructor gave the lesson. Miss Zuill gave two lessons in household economics; Mr. Denslow, three lessons in physics; Dr. Brooks, several group intelligence tests; and Mr. Denues, several music lessons in the third grade; but these were in addition to the more than 35 lessons regularly announced for observation and given by the class teachers.

Since as many as 200 observers were present at some of these lessons, it is impossible even to estimate the aggregate number of observers or the number of visits to the demonstration school during the six weeks of the university summer session. To afford sufficient accommodation for these observers at a scheduled demonstration lesson, it was necessary to have one very large room in each building reserved for this purpose. The junior high children were used to changing rooms in departmental work, but the elementary children were used to one room all day. It was, therefore, necessary to plan to rob the situation of its strangeness for them.

A very large room was placed at their disposal. The whole front was a series of blackboards. By placing the teacher's desk in front and very near the side wall and arranging the children's desks in a small group just in front of her desk it made the children lose the feeling of the bigness of the room because they were all up in one corner with the blackboards, teacher's desk and side windows just about the

ordinary distance from them. Any elementary teacher had the privilege of taking her class in this room for a lesson at any time there was no demonstration lesson scheduled for it. In this way the children got to feel at home there. Then, when they were in the room for the purpose of demonstration, the crowd of observers was behind them, and they scarcely ever seemed conscious of anything but their own teacher and the work in hand.

7. *An Educational Experiment*

Problem: Can children do a half-year's work in two months?

Given:

1. Children of normal or above normal scholastic attainment.
2. Teachers above the average and in sympathy with the experiment.
3. A definite course of study.
4. Fairly good equipment.
5. A four-hour day.
6. The advice and services of an educational psychologist.

Grades included in experiment: 4th through 9B.

Plan: Before the opening session, classes were organized from lists submitted by principals, and teachers of the Homewood School had planned the work to be done to include the most important topics of the term's work.

Regular work started the very first session and continued until the close of the last session. Practically no time was spent in anything but the real business of teaching. Since the work was to be covered in about half the usual time, there was a minimum of review and drill work. Teachers keyed their work to the brightest group in the class, since this was an experiment to see if any could do the work in this time.

Dr. Fowler D. Brooks, of the Johns Hopkins faculty, gave the National Intelligence Test and the Monroe Silent Reading Test to each class the second or third day, and on the fifth day was ready with scores in these two tests to advise teacher and principal how best to solve the problem of ever-crowding in 6A, 7A and 8A classes.

Work was divided into two parts, and the end of the first month set as the time for covering the first half. Reports on effort, attendance and marks in each of the principal subjects of the grade were tabulated by each teacher and submitted to the principal, and a regular report card containing this information was given to each child. Reports were rendered at the end of the fourth and the eighth weeks.

There were frequent meetings of the teachers of the junior high classes. These were valuable chiefly as opportunities to the teachers to give and receive information about individual pupils; and also because they gave the principal the data necessary for a private conference with those pupils who seemed to need it.

The most significant faculty meeting was that for the purpose of recommending pupils. Recommendation was based on

1. Pupil's marks.
2. Teacher's judgments.
3. Psychological tests.

If marks were satisfactory, that is, above 70 in all subjects, a favorable decision was automatically rendered. If one or more marks were below 70, the teacher's knowledge of the child's physical, mental or moral peculiarities and the general or particular strength or weakness as shown by the mental tests were of great value. Dr. Brooks cast the deciding vote for many of these. Most cases of this kind were marked *on trial*, and some such hint was given as weak in *mathematics, lazy, I.Q. high, weak, health* or *danger of overwork*.

Each case was handled from the individual standpoint. What that one child could do profitably was the one aim. We were not after results en masse; we wished to find out what each given child could do in much the same way that a physician studies and treats and advises each patient, or as the scientist studies and notes reactions in the laboratory. We wanted *to know* what these children could do under given conditions.

Authorities seem to agree that the best 10 per cent. of the enrollment in the usual school can do rapid work successfully. On the other hand nobody had said that they could do it in two months rather than the usual five months. Nobody knew who could or could not do it. This was the experiment.

It was for this reason that one principal encouraged as many as possible of the children of the seventh or eighth grades who had passed in all subjects to try the work at Homewood. These furnished a kind of check or control group, since if only the very bright had a chance nobody would know whether or not other children could do it.

Results in 7-8-9 seem to show that the just about normal children can not succeed and that it is not wise to attempt to force them. On the other hand most principals were probably over-cautious in recommending children to Homewood. It would be interesting to see what would result if the best two or three from each A' or B' class in the schools were allowed to take up this work.

FOLLOW-UP WORK

Each child who passed at Homewood was given a card stating that fact to take back to his own school. A communication was sent by the Homewood principal to each principal whose children had passed at the summer school, and a statement was issued that a report on the progress of each of these children would be asked for in February. This was done to test the worth of the work done, that is, to see if it had been done with enough understanding and thoroughness to form a foundation for succeeding work.

In February, 1922, a card was sent out for each child as to class in September, class in February, and marks for the semester.

STATISTICS

A. *Junior High Classes*

Net Roll, 112.

1. *Age-Grade*

	No. of pupils	Per cent.
Below normal age	37	33
Normal age	62	55
Above normal age	13	12

2. *National Intelligence Test*

Above normal	92
Normal	1
Below normal for grade	7

3. *Monroe Silent Reading Test*

Above normal	67
Normal	1
Below normal for grade	32

4. *Results at Homewood*

Passing	87
Failing	13

5. Of the 87 per cent. passing
63 per cent. were above 70 in all studies.
7 per cent. were on trial.
17 per cent. were below 70 in one or more subjects.

6. *Results in February*

Of the 87 per cent. of Homewood net roll passing in August
75 per cent. (of net roll at Homewood) passed.
6 per cent. (of net roll at Homewood) failed.
3 per cent. (of net roll at Homewood) withdrew.
3 per cent. (of net roll at Homewood) returned to private school.

It is the universal rule in our schools to base the percentage of recommendation and failure on the net roll at the end of the term; hence we have

7. Of those remaining in our schools in February
91 per cent. passed.
9 per cent. failed.

A comparison of Tables 4 and 7 would seem to indicate that at least a reasonable degree of caution was exercised in passing children at Homewood, and that those who were recommended had very good chance of success in the next term's work.

B. *Intermediate Grades*

8. *Age-Grade*

	No. of pupils	Per cent.
Below normal	7	8
Normal	58	70
Above normal	18	18

It must be borne in mind that the normal age for the fourth grade is 9-10 years and that children less than that age are not likely to be able to go long distances.

9. *National Intelligence Test*

Scale A—Form 1

Above normal for grade	82
Normal	4
Below normal	14

10. *Monroe Silent Reading Test*

	5th	4th
Above normal for grade	81	90
Normal	0	0
Below normal	19	10

This test was not given to 6B.

11. *Results at Homewood*

Passing	94 per cent.
Failing	6 per cent.

12. *Of the 94 per cent. passing*

16 per cent. on trial.

13. *Results in February*

Of the 94 per cent. of Homewood net roll passing

80 per cent. passed in February.
8 per cent. failed in February.
1 per cent. withdrew.
5 per cent. returned to private schools.

14. *Of those remaining in our schools in February*

90 per cent. passed.
10 per cent. failed.

While Table 14 shows that February results were not so good in these grades as in the 7-8-9, it is shown in Table 11 that a larger percentage was recommended in these grades than in 7-8-9 at Homewood.

C. *All Classes 9B-4*

15. *Age-Grade*

Below normal	23 per cent.
Normal	61 per cent.
Above normal	16 per cent.

16. *National Intelligence Test*

Above normal for grade	88 per cent.
Normal	2 per cent.
Below normal	10 per cent.

17. *Results at Homewood*

Passed	90 per cent.
Failed	10 per cent.

18. *Results in February*

Passed	91 per cent.
Failed	9 per cent.

TESTS

A. *National Intelligence Test A-1*

All Classes

NORM	GRADE	ABOVE	NORMAL	BELOW	TOTAL	RANGE OF THOSE PASSING
136	9B	9	1	1	11	121-185
132	8A	26	0	2	28	126-177
127	8B	11	0	1	12	119-170
120	7A	23	0	1	24	133-167
111	7B	25	0	1	26	115-159
111	7B[1]	9	0	2	11	115-128
Totals		103	1	8	112	
Per cent.		92	1	7	100	

From a study of the range of the scores of those who passed, it seems safe to say that a child needs a score of not less than 115-120 in this test to succeed in this rapid work in 7-8-9.

NORM	GRADE	ABOVE	NORMAL	BELOW	TOTAL	RANGE OF THOSE PASSING
96	6B	25	2	3	30	96-147
87	5A	26	1	7	34	78-147
68	4	17	0	2	19	72-114
Totals		68	3	12	83	
Per cent.		82	4	14	100	

National Intelligence B-1

B-1 was given several days later, and while normal children are supposed to score two points less in Form B than in Form A, 39 of the 112 children in the 7-8-9 made higher scores in the second test.

B. *Monroe Silent Reading Test*

9-8-7

R-C NORM	GRADE	R-C ABOVE	R-C NORMAL	R-C BELOW	R-C TOTALS
108-27.5	9B	6-7	1-0	2-2	9-9
106-26.4	8A	13-11	0-1	9-10	22-22
102-24	8B	6-6	0-1	4-3	10-10
99-23	7A	16-16	0-0	4-4	20-20
92-21	7B	15-15	0-0	8-8	23-23
	7B[1]	(Not given)			
Total numbers		56-55	1-2	27-27	84
Rate		67%	1%	32%	
Comprehension		66%	2%	32%	

This seems to indicate that rate of reading and comprehension of meaning were closely correlated in these children, yet this test gives a much lower rating for the Homewood children than the National Intelligence Test. Their performance is evidently not up to the top of their ability or capacity.

GENERAL REMARKS

Children below normal age are able to do this rapid advancement work thoroughly enough to succeed in the next grade.

Children of about normal scholastic attainments are not apt to be able to do this work successfully in such a short time.

Principals were apparently over-cautious in recommending children to the rapid advancement classes.

The long distance some children had to come may have caused many to drop out, but it seemed to have no unfavorable effect on those who persevered till the end of the term.

SUMMARY

With children well above normal in intelligence for grade, with experienced, enthusiastic teachers, fairly good equipment, and a well

[1]7B was the small group promoted from 6th grade.

defined plan of work, it is possible to cover successfully a half year's work in two months.

M. Rose Patterson
Johns Hopkins University

DISCUSSION AND CORRESPONDENCE

THE AIM AND METHOD OF EDUCATION

Life is undoubtedly quite as complex as the most baffled and the timidest of us all allege. None are, therefore, more astute than they who insistently warn against the peril and the futility of simplification. We must reverence every relevant reality, however minute, however perplexing.

And yet I think a German friend of mine was right who told me, long before the war, that probably the main strands in the pattern of life will be simple after all. They certainly do not appear to be easily selected though. But that may be because selection implies renunciation of privately desired but inharmonious strands.

At any rate men and women who think are in pretty general agreement that the indispensable way of increasing the sum, improving the quality, intensifying the degree, and extending the distribution, of human happiness is "real education," "education of the right sort."

The more liberal of university executives, and the professors of pedagogy are vociferating that they know not what that right sort is. And not being able to discover what true education is, they set about devising elaborate but all too simple tests to find out how much of it their victims have acquired or are qualified to take. And they propose experimental changes. Some tell us we must have a more organic curriculum. Some say we must pay teachers enough so that public opinion will rate them more nearly as it does bankers and business executives. Some declare that we must prepare text-books better adapted to the existing interests of the general student body. Some argue for more freedom of election Their opponents demand that the choice of studies be more stringently directed. Some affirm that we must provide higher education for more nearly all the junior population. Others decide that higher education must be intensified and purified and withheld from all save potential leaders. We hear many words about democracy in education. And we are all weary of the dispute between advocates of culture and proponents of vocational education.

Why don't we resolutely and patiently determine the purpose of education? To me that seems so much less difficult than others say it is that I am going to venture my daily strengthening conviction. And then I shall suggest what seems to me the method. Old it is, but slightly used.

If life has a meaning, as I believe it has in the future, the aim of life is as much happiness as possible universally participated in, and made sure and perennial by unflagging mutual friendliness. Then the purpose of education is, precisely what the reactionaries derisively aver, changing human nature.

No freely thinking man whose life was directed by an integrated personality including intelligence would give his life to education unless he cherished a hope, however faint, that it might gradually accomplish just that purpose. Indeed I don't see how such a man, despairing of that hope, could satisfy himself with anything less noble than extinguishing his brief candle.

To be severely practical, however—and if this is not practical, how can anything on earth be practical?—the purpose of education is making such an impression on the consciousness of every normally complete individual as shall thus modify and integrate his personality: provoke his curiosity so that beauty may be disclosed to him, and he may acquire a saving sense of the absurd; intensify his courage, and direct his fighting instinct, as well as his instinct of repulsion, against ignorance and selfishness and sham; transmute his fear into circumspection; sublimate his sexual impulse into a three-fold power—a strengthener of his constructive instinct, a power of ever-renewed love for a soul and body mate, and a power of affection to render his gregariousness kind; and, not least, raise his acquisitive instinct into an unconquerable desire to get knowledge and wisdom for himself, and beauty and joy for the race which constitutes his larger self.

That and nothing less is the aim that can suffice for a sceptical, warm-blooded teacher. It is changing human nature. But it is not destroying any native element. Nor does it imply that any of our primary heritage must be suppressed. What I have attempted is merely a description, in more or less psychological terms, of what Jesus called being born again. He said "Ye must be born again." And he never denied one inherent human limitation. He knew our frame. He remembered that we are dust.

It was by his almost unmatched insight that he discovered the oft-repeated, and nearly always diminished, truth that the love of profit is the root of all remediable evil. And he, like many an obscure, as well as famous, hero, exemplified in his life the human practicality of developing an indomitable ego which finds its freedom and its realization in giving life (not to speak of giving it up) in the very slightly successful effort to enable others to live more fully. He, like individuals we all may know, was liberated from the safety-seeking motive while his instinct of fear saved him from folly and functioned in foresight. Jesus, like persons we all know, found expression for his love instinct in warm and vital friendliness, first for those he closely lived with, and, then, for all his fellows, living and to come. Further, I can't doubt that his sex instinct, like that of men whose lives we read, flowed also into his creative life and teaching. And, finally, his attention to realities and their difference from shams flowered in a saving sense of humor, and in a constantly refreshing appreciation of the loveliness and mystery in life.

Ah! but—when one looks upon his companions in an East-side elevated train, or, for that matter, at grand opera, can he cherish the aim I have stated as the practical purpose of every-day education? A thousand times yes! For entertaining any lower aim is providing for the everlasting multiplication of just such pitiable and futile souls. It is diving over a precipice into a boiling quicksand.

The sublimity of education rests upon a two-fold sanction: the overwhelming necessity; and the infinite unattainableness. For the only aims in life that can hold the enthusiasm of a reflective mind are those the infinitesimal approximation of which establishes a positive, and theretofore non-existent, good!

"But where are you going to get your teachers?", I imagine some practical pedagogue on Morning Heights exploding. Indeed that is the real problem of method. But if as the experts often remark, Jesus was the greatest teacher, why not consider how he answered the question? Did he not gather from the obtuse and ignorant multitude a small number of earnest souls, and by free and frank companionship, incubate in two or three of them the brotherly, creative spirit? Was not the greatness of his faith measured by his daring to entrust his vision to simple, common men?

If, then, education is to be increasingly the validation of human life, all who care about people, all who see that real enduring satisfactions must be communal and mutual, share the obligation, to be—by tongue, or pen, or brush, or fingers on the clay, or voice or instrument, or pantomime, or dancing feet; and everyone by conduct—constant though preferably unconscious teachers. And the method of those who arrogate unto themselves the name of educator will be the not altogether hopeless effort to find for professional instructors of youth—whether in class-room, laboratory, studio, shop, stock-barn, or experiment station—men and women who have been changed in nature, "born again," knowing that only such can achieve true midwifery of souls.

SIDNEY HAYES COX
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REGARDING BUREAU OF EDUCATION BULLETIN 1922, NO. 6

TO THE EDITORS OF SCHOOL AND SOCIETY: I am asking you to insert in an early issue of your magazine the inclosed list of errata occurring in my recent monograph, State Policies in Public School Finance, United States Bureau of Education Bulletin, 1922, No. 6.

I suppose anyone who has any experience in the publication of statistical studies knows that it is well-nigh humanly impossible to pro-

duce a work, however brief, entirely free from errors. Most of the errata included in this list are of minor importance. One or two, however, it seems to me, are of considerable importance.

This bulletin has now been widely distributed and I could think of no way of reaching its readers as quickly and directly as through the columns of your magazine.

LIST OF ERRATA IN STATE POLICIES IN PUBLIC SCHOOL FINANCE, BUREAU OF EDUCATION BULLETIN, 1922, NO. 6.

On page 10, in Table 12, (B) the last total should read, *16.59* instead of *16.9*.

On page 14, in Table 18, Note 8, should read, *between 23 and 9* instead of *22 and 9*.

On page 16, in Table 20, Somerville in the last column should read *1* instead of *4*.

On page 21, the last word in the second line of the page should read *it* instead of *is*.

On page 22, Table 27, Part II, under "Available to . . ." should read *Twenty-six* States, (all States included in the Union) instead of *Twenty-eight*.

On page 31, in the seventh line of the first paragraph the word *and* is misspelled.

On page 32, in the second paragraph and the sixth line, should read *16.6* instead of *17.7*.

On page 38, Table 44, eliminate *Delaware*.

On page 41, in the second paragraph under "Inheritance Taxes" *eliminate the first two lines concerning Delaware*.

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EDUCATIONAL RESEARCH AND STATISTICS

THE CORRELATION BETWEEN THE I. Q. AND THE A. Q.

IT is the purpose of this article to present significant data bearing upon the relationship existing between capacity, as indicated by the I.Q., and actual achievement, as indicated by the A.Q. (accomplishment quotient). A summary will be given here of the results of projects carried out under the direction and supervision of Professor Stephen S. Colvin by members of a class in experimental education at Brown University. The students in this class were almost without exception teachers in service or candidates for advanced degrees. During the academic year ended June, 1922, this group of students received a thorough grounding in the theory and administration of mental tests and tests in the various school subjects. Subsequently, in April and May various members of the class were delegated to conduct mental and educational surveys which involved one or more elementary school grades, depending on circumstances and opportunities. Several Rhode Island communities afforded scenes for the different projects.

In grades 5-8, inclusive, the National Intelligence Test (A) and the Lippincott-Chapman Test (in arithmetic and reading) were used. In the lower grades use was made of the Otis Primary Group Intelligence Scale and the Haggerty Reading Examination, Sigma I. In either case the individual scores on the intelligence tests were converted into mental ages and the individual I.Q.'s were found. The scores on the school products tests were converted into pedagogical ages and the individual accomplishment quotients (A.Q.'s) were found by dividing the pedagogical age by the mental age. Thus there was found for each pupil tested an I.Q. and an A.Q. To be sure, other facts and computations were entered into but the present purpose is to draw attention to the relationship that was found to exist between the I.Q.'s and the A.Q.'s.[1]

Just in passing, it may be of interest to make mention of the high coefficients of correlation found between scores on the National Intelligence Tests and scores on the Lippincott-Chapman Test in reading and arithmetic. The grades canvassed by means of these tests were the fifth to the eighth, inclusive, and the number of persons in each grade ranged from 12 to 124 with an average of 45. Eighteen coefficients of correlation were computed by the rank difference method between these two tests ranging from .45 to .88 with a median of .68. Two coefficients of .65 and .66 were found by the product-moments formula and were based upon 106 and 124 cases respectively.

[1] For detailed instruction in the procedures merely hinted at in this paragraph see "How to Measure in Education," by W. A. McCall; Macmillan, 1922.

The data revealed by the various projects, in regard to capacity and actual accomplishment, are in very close agreement with the results presented by Murdock in a recent number of the *Teachers College Record*.[2] At Punahou School, Honolulu, Murdock found high negative correlations to exist, in a mental and educational survey of 415 pupils; for the I.Q. and the Reading A.Q. an r of —.45 is reported and an r of —.73 between the I.Q. and the Arithmetic A.Q. Table I shows thirteen coefficients computed by members of the Brown University class. The rank difference method was used, except as noted.

TABLE I

CORRELATION OF I.Q.'S AND A.Q.'S.

Coefficient	No. of Cases	Grade
—.71	49	5
—.66	38	3
—.60	33	5
—.59	35	6
—.58	27	7
—.54	42	6
—.50[3]	409	5-8 incl.
—.45[3]	232	5-7 incl.
—.34	38	6
—.31	30	2
—.23	18	8
—.22	28	1
—.02	36	5-7 incl.[4]

Average coefficient equals —.44. Median coefficient equals —.50.

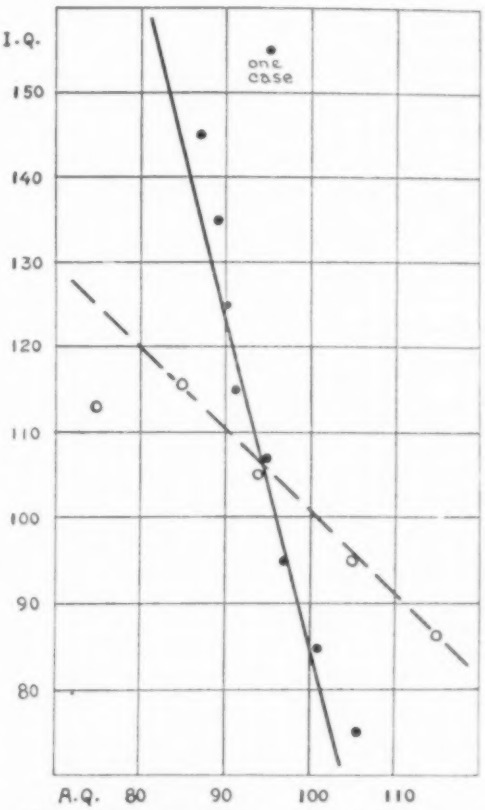
It is easily seen from this table that the range is from just about no correlation at all to the very high negative correlation of —.71.

A few additional facts may well be presented concerning the 409 cases that yielded a *negative* correlation of .50. The data here considered were obtained from grades five to eight, inclusive, in a representative elementary school in the city of Providence. Figure I represents the above mentioned relationship by means of the regression lines. This shows very clearly how increases in the I.Q. are accompanied by decreases in the A.Q. and that, on the whole, pupils having I.Q.'s above 85 are not working up to capacity and the greater the intelligence of the pupil the less is he actually accomplishing that which one is justified in expecting him to accomplish. The regression equations and the plotted lines show that for every ten points of *increase* in the I.Q. there is a corresponding *decrease* of two and one half points in the A.Q. Moreover, if the 409 cases be divided into groups of

FIGURE I

CORRELATION OF I.Q. AND A.Q.

Based on 409 cases from grades 5 to 8 inclusive.



KEY: Solid line shows mean A.Q.'s for any given I.'Q.'s, the actual means being indicated by dots.

Broken line shows mean I.Q.'s for any given A.Q.'s, the actual means being indicated by circles.

Mean I.Q. = 106.7
Mean A.Q. = 94.4
Sigma I.Q. = 16.
Sigma A.Q. = 8.3
Pearson r = —.50

Note that when the I.Q. rises 10 points, the A.Q. *drops* 2.5 points. When the A.Q. rises 10 points, the I.Q. *drops* 9.5 points.

[2] Vol. XXIII, No. 3, May, 1922.

[3] Product-moments formula used.

[4] Data from a small private school.

below normal, normal, and above normal intelligence in terms of the I.Q., it is found that the mean A.Q.'s for each of these groups are 103.1, 95.5, and 90.5, respectively. No significant sex differences are indicated in either the I.Q.'s or the A.Q.'s. If the converse regression be considered, the I.Q.'s on the A.Q.'s (represented by the broken line in Figure 1), it is evident that, roughly speaking, the A.Q.'s of 100 or *more* are made by pupils having I.Q.'s of 100 or *less* and the A.Q.'s of *less than* 100 are made by pupils having I.Q.'s of *more than* 100. Whichever regression be considered, we have a striking portrayal of the fact that the superior children are not working up to their capacity as well as do normal children and that the less gifted children exceed both of these groups in this respect by doing just about what one is justified in expecting of them.

From such data as has been here presented, it is quite fair to conclude, as others have done from like data,[5] that existing standards of achievement in the elementary school are better suited to the slower pupils than to either the normal or the superior pupils. Accordingly, the normal (average) and especially the superior children are not working up to their capacity and under such conditions can only be expected to contract habits that are not conducive to studiousness and industry. In actual practice, it was found in the case of the above-mentioned elementary school that 60 per cent. of the four hundred odd pupils were retarded 17.9 months each, on the average, with respect to mental age. In other words, the mental age of 60 per cent. of the children was one year and a half beyond the average mental age of the grade in which each pupil was found to be classified. In terms of intelligence these pupils were capable of doing work beyond what they were being asked to do. Likewise, in terms of the school subjects tested, 33 per cent. of the pupils were found to be classified nearly one year (10.9 months), on the average, *below* where one would expect to find them. In other words, their pedagogical age exceeded by nearly a year the average pedagogical age of the grade in which each was found respectively. Note that *average* figures are mentioned. This means that many were retarded by a much greater number of months than the average figure quoted here, in respect to both mental and pedagogical age. Surely there is much need for such changes in methods of classification and in the incentives offered pupils as will take into consideration the capacity and mastery of subject matter possessed by the various individuals and require of each pupil full use of the talents with which he is endowed.

Andrew H. MacPhail

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[5] R. Franzen found in his study of pupils in the Garden City public school that "brilliant children are over-praised for work which, though over the ability for the group, is under their own ability," (*Teachers' College Record*, Vol. 21, 432-440, November, 1920). As Whipple puts it, Franzen "has recently shown that if pupils are *pushed to the extreme of their ability*, the correlation between their educational achievement and their intelligence is not only high, but actually reaches unity . . ." (G. M. Whipple in School and Society, Vol. XV, No. 388, June 3, 1922) (Italics by MacPhail). "Stenquist has recently found a negative correlation of 0.40 between effort and intelligence . . . . The pupils with high abstract intelligence test scores learn what is offered for the average pupils and then loaf. Their need is not merely for more work but also for a different type of training." (M. R. Trabue in *Journal of Educational Research*, Vol. VI, No. 1, June, 1922, pp. 8, 9). In reporting upon a survey of the first five grades of a large elementary school Pintner and Noble (*J. Ed. Re.*, 1920, Vol. 2, pp. 713-728) state that 27.6 per cent. of the pupils "were in grades below those to which, according to their mentality, they should have belonged . . . there is evidently large wastage of good mental material—a wastage such as we always find in schools made up of children of good mental ability." In another place Pintner and Toops refer to "the tendency of the schools to retard children who are perfectly normal or slightly advanced mentally." (*J. Ed. Psy.*, 1919, Vol. 10; pp. 253-262). T. L. Torgerson concludes from an analysis of test results obtained in the West Allis Schools, Wisconsin, that "the average slow pupil is working at a higher rate of efficiency than the superior pupil," (*Journal of Educational Research*, Vol. VI, No. 1, June, 1922).